

markings is so wide (as is proved by the gradational transitions which present themselves between what at first sight appear to be widely-separated types), that only where some very decided and constant difference of internal conformation presents itself, will it be safe to assume a specific diversity. In one case, in which he had thought that a certain series of specimens was sufficiently distinguished by its peculiar physiognomy from the rest, residual forms presented themselves which could not be with certainty assigned to either type, so completely do they link together the two by the softening down of the peculiarities of each. And a yet more remarkable link of connexion is established by examples collected on the coast of Japan by the American expedition to that country, in which the most distinctive characters of each type are curiously combined.

Closely related to *Operculina* is another genus, *Amphistegina*, which bears an equally near resemblance to *Nummulites*, though it has been completely separated from both in the classification of M. d'Orbigny, who has placed it in a distinct order, *Entomostegues*, on account of the unsymmetrical form of its shell and the alternating disposition of its chambers. But the author has found, from an extensive comparison of individuals, that this want of symmetry is so little constant, as to be altogether valueless in a systematic point of view, many specimens being perfectly symmetrical, whilst others are very far from being so, and every gradation presenting itself between these two extremes. The most common among existing species is the *Amphistegina gibbosa*, which is very extensively diffused through the tropical ocean, and which, though generally of small size, acquires in the Philippine region dimensions nearly equal to those of the fossil *Amphistegina* of the Vienna and other tertiary deposits. But Mr. Cuming's Philippine collection contains another and far larger species, which is distinguished by the extraordinary thinning-out of the last whorl; and it is remarkable that in this species the canal-system is highly developed, although completely absent in *A. gibbosa*,—a difference of structure, which, being associated with a very close resemblance in external aspect and general conformation, seems only to be accounted for on the supposition that the difference in size requires a difference in the arrangement of the nutrient apparatus.

#### ZOOLOGICAL SOCIETY.

March 9, 1858.—Dr. Gray, F.R.S., V.P., in the Chair.

PROPOSAL TO SEPARATE THE FAMILY OF SALAMANDRIDÆ, GRAY, INTO THREE FAMILIES, ACCORDING TO THE FORM OF THE SKULL. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., PRES. ENT. SOC., ETC.

In the Catalogue of Amphibia in the British Museum I placed all the Salamanders which have teeth on the inner side of the hinder edge of the palatal bone together in a single family, under the name of *Salamandridæ*.

Having lately procured the skulls of several of the genera so united, and also examined M. Gervais' and M. Dugès' papers in the 'Annales des Sciences Naturelles,' in which the skulls of several other genera and species are figured, I am now induced to propose to divide the genera into three sections or families as follows.

In a group which offers so few permanent characters for the separation of the genera and species, and which presents such different varieties in the form of the dermal appendages, and in the colour of the body at different seasons of the year, one is very glad to seize on any part which appears to offer a permanent and tangible character.

### Fam. I. SEIRANOTIDÆ.

*Seiranotina*, Gray, Cat. B. M. 1850, 29.

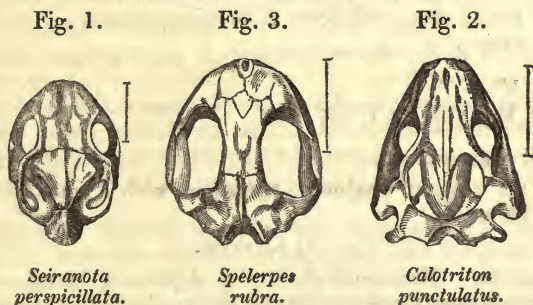
Skull very depressed, broad; the fronto-temporal arch distinct and united to the bones of the skull (figure 1). Tongue large, hinder half free. Body granular. Palatine bones with a longitudinal series of teeth forming two diverging series, angular in front. Ribs well developed. Vertebrae crested above. Limbs and feet well ossified. Toes 4.4.

#### 1. SEIRANOTA.

Lateral line none. Skin closely and equally granular, granules oblong.

SEIRANOTA PERSPICILLATA (skull, fig. 1).

B.M.



### Fam. II. PLEURODELIDÆ.

Skull depressed, broad, with a distinct fronto-temporal arch, formed by the union of a process of the frontal and temporal bone (fig. 2). Tongue moderate, attached; hinder and side edges scarcely free. Body granular. Palatine bone, with a longitudinal series of teeth forming two diverging series, angular in front. Ribs well developed. Vertebrae crested above. Limbs and feet well ossified. Toes 4.5.

a. *Fronto-temporal arch complete. Lateral lines of pores distinct, low down between the axilla and groin.*

### 1. PLEURODELES.

Ribs exerted, forming a series of spines along the sides. Head and skull depressed, broad. Paratoids distinct.

#### 1. P. WALTI.

Skull, Erp. Gén. t. 101. f. 2.

“*Bradybates ventricosus*, Tschudi, t. 2. f. 1, is perhaps the young.”—*Duméril*. It only differs in the tail being short, perhaps injured.

### 2. GLOSSOLIGA.

Ribs enclosed. Head and skull very depressed. “Fronto-temporal arch with a separate central bone.”—*Gervais*. Paratoid none; lateral pores small, single, in a continuous line.

#### 1. GLOSSOLIGA POIRETI.

B.M.

Erp. Gén. t. 107. f. 1. Skull, *Gervais*, Ann. Sci. Nat. 1853, xx. t. 15. f. 9, & Erp. Gén. t. 102. f. 5, 6.

Forehead flat, with small scattered brown-tipped tubercles. Eyelids distinct, valvular.

N. Africa.

### 3. NOTOPHTHALMA.

Ribs enclosed. Head and skull rhombic. Forehead with two longitudinal ridges. Tongue oblong. Paratoids none. Cheek with three pits. Hind feet flattened. Tail compressed, keeled, often slightly finned above and below in breeding season.

N. America.

#### 1. N. MINIATA.

B.M.

Skull, Erp. Gén. ix. t. 107. f. 2.

#### 2. N. VIRIDESCENS.

B.M.

Vent in summer produced, truncated, with a rounded series of fringed filaments.

### 4. CYNOPS.

Tubercular. Head and skull very depressed, broad. Paratoid large, compressed; pores of lateral line small, distant, more distinct near the limbs. Fronto-temporal arch broad, distinct. Ribs enclosed.

#### 1. C. PYRRHOGASTER.

B.M.

Skull, Tschudi, t. 2. f. 5, cop. Schlegel, Fauna Japon. t. 5. f. 7, 8; Cat. Batrach. B.M. t. 3. f. 13.

Japan.

### 5. TARICHA.

Tubercular. Head and skull depressed, broad. Paratoid large,

compressed. Pores of the lateral line small, indistinct, far apart. Vent small. Fronto-temporal arch broad. Skin with conical tubercles. Ribs enclosed.

## 1. TARICHA TOROSA.

B.M.

Skull, Esch. Zool. Atlas, t. 21. f. 15.  
California.

b. *Fronto-temporal arch complete. Lateral line indistinct, marked with a vessel; ribs enclosed.*

## 6. CALOTRITON.

*Hemitriton*, part., A. Dugès.

Head and skull rhombic. Eyelids distinct. Skin smooth, with small black-topped conical warts. Tongue oblong. Paratoids none. Toes free; tips black, rather claw-like. Vent conical.

## 1. CALOTRITON PUNCTULATUS (skull, fig. 2).

B.M.

*Hemitriton punctulatus*, A. Dugès, Ann. Sci. Nat. xvii. 265. t. 113. f. 1, 2; skull, Dugès, *l. c.* f. 3 & 18.

*Triton puncticulatus*, Erp. Gén. ix. 152. t. 106. f. 3; skull, t. 102. f. 4.

## 7. EUPROCTUS.

*Hemitriton*, part., A. Dugès.

Head and skull rhombic, depressed. Tongue oblong. Paratoids none. Skin smooth, with scattered small rounded black conical warts. Cloaca produced, conic. Lateral lines of pores none.

## 1. EUPROCTUS RUSCONII.

B.M.

*Hemitriton asper*, skull, A. Dugès, Ann. Sci. Nat. xvii. t. 113. f. 21, 22.

*H. cinereus*, skull, Dugès, *l. c.* f. 14, 15; *H. rugosus*, skull, *l. c.* t. 1. f. 16, 17, and *H. Bibronii*, skull, t. 1. f. 19, 20, are evidently very nearly allied, if not all the same species.

## 8. LOPHINUS.

Body smooth. Palatine teeth in two separate series. Orbit in palate small. Fore toes slender, very unequal; the hind toes broad, webbed on each side, the two inner conic. Back three-ridged. Crest of male continued. Lateral lines with distant single pores. Tail of male suddenly truncated before the apex, ending in a filament.

## 1. LOPHINUS PALMATUS.

B.M.

Selys-Longch. Faun. Belg. t. 5. f. 1, 2, good; skull, Dugès, *l. c.* t. 1. f. 27, 28.

*Triton*, Wooley; Baker & Deby, Zoologist, 1848, 2149, &c.

*Triton minor*, Higginbottom, Ann. & Mag. N. H. 1853, xii. 382. t. 16. f. 8, 9.

*Lissotriton palmatus*, Bell, British Reptiles, second edit. 1849, p. 154 (not of first edition).



“In the season of reproduction the tail of the male is suddenly truncated before the apex and terminated in a slender filament 3 lines in length. The hind feet perfectly palmated, all the toes united by a membrane (t. 16. f. 8). When the breeding season is over, the slender filament is absorbed, and the truncated portion of the tail becomes obtusely rounded off with a slight indurated dark tip at the end, and the web of the hind feet is wholly absorbed, leaving the toes free (t. 16. f. 9).”—*Higginbottom*.

Mr. Bell admits and figures this species in the second edition of his ‘British Reptiles,’ 1849, p. 154. The figure is not characteristic, as the crest of the male is not sufficiently high, and the coloration is differently disposed from any specimen which has come under my observation.

#### 9. OMMATOTRITON.

Body smooth. Palatine teeth in a crowded series. Orbits in palate large, convex. Crest of male interrupted over the loins. Legs with a membrane on the inner edge. Hands with a subulate tubercle. The hind toes free, very slightly fringed with membranes. Lateral line of pores distinct, single.

##### 1. OMMATOTRITON VITTATUS.

B.M.

*Triton vittatus*, skull, Dugès, l. c. t. 1. f. 29, 30.

England; North of France; Belgium.

Mr. Bell, in his ‘British Reptiles,’ gives a good figure of one of my specimens of this species, which he is convinced “is to be considered as a variety only of *Lissotriton palmipes*.” The osteological character, as well as the form of the dorsal crest and the disposition of the colours, show that this is not the case, and that it is not only a distinct species but a very distinct genus, as is further proved by M. Dugès’ figure of the skull.

c. *Fronto-temporal arch incomplete, ligamentous behind.*

#### 10. PYRONICIA.

*Hemisalamandra*, *Hemitriton*, et *Triton*, part., Dugès.

Body slightly tubercular. Hinder toes fringed with a membrane. Back smoothish. Males with a crest. The skull with only a frontal process directed backwards and outwards, the temporal apophysis in the other genera being replaced by a tendinous cord.

##### 1. PYRONICIA MARMORATA.

B.M.

Skull, Erp. Gén. t. 106. f. 1.

*Hemisalamandra marmorata*, Dugès, Ann. Sci. Nat. xvii. t. 1. f. 10, 11.

Back marbled, vertebral line pale. Pores of the lateral line distinct, in pairs. Skin smooth, punctulate, subtuberculous.

Oporto.

## 2. PYRONICIA PUNCTATA.

*Triton punctatus*, Dugès, l.c. t. 1. f. 25, 26; Bell, Brit. Rept. ed. 2.

*Triton lævis*, Higginbottom, Ann. & Mag. N. H. xii. 380. t. 16. f. 6, 7.

*Lissotriton punctatus* and *L. palmatus*, Bell, Brit. Rept. ed. 1, 1839 (not Latr.).

Pupils circular, rather larger than those of *T. cristatus*.

The figures of the Smooth Newts (*Lissotriton*) in Mr. Bell's 'British Reptiles' (1839) are so destitute of character, that it is impossible to refer them to the known species with certainty. The figures of *L. punctatus* at pp. 132 and 135, appear to be that species in its winter state; and the figures of *L. palmipes* at p. 139 appear to be intended for the same species in summer, if we regard the disposition of the spots, and the height of the dorsal fin: but the fin is not dentated, as it always is in that species, and the toes are not proper for it in its crested state; at the same time it bears no resemblance to the true *T. palmatus*, which has an entire crest; nor has it the filament at the end of the tail, which is always found in the crested form of that species.

In the second edition (1849), Mr. Bell has referred all these figures to *Lissotriton punctatus*, and places the figure which he formerly called *L. palmatus* at the head of the species, p. 143; but it is not characteristic of it, as wanting the dentation on the crest and the broad rounded end fringe of the toes, which are so characteristic of the crested state of the species.

Mr. Bell, believing that the form of the upper lip afforded a good character for the distinction of the species of these animals, divides them into two species, thus—"1. *Lissotriton punctatus*, upper lip straight, not overhanging the lower (p. 132, 138, fig. 2). *Lissotriton palmipes*, upper lip pendulous at the sides, overhanging the under in a distinct festoon as far as the base of the lower jaw. Toes of hinder feet fringed with a short membrane at all seasons." I may observe that the latter is not the *T. palmipes* of Latreille, which has the hind feet of the male in the breeding-season webbed; and that I believe it only differs from the former by being in the fully-developed state at the season of reproduction; and I am borne out in this idea by the observations of Messrs. Higginbottom, Hogg, and many others.

The former observes: "Some *Tritons* have been distinguished by the upper lip overhanging the lower. I have observed that in the first year of *Triton asper* the upper lip overhangs the under considerably at the sides; in the second it overhangs less; between the second and third year it becomes straighter, and in the fourth it overhangs again as much as in the first year. This is also very evident in the *Triton lævis*, in which the same changes take place."—*Ann. & Mag. N. H.* 1853, xii. 375.

"Neither kind of *Triton* is found in the water during the winter months; but they (the brick-makers) discovered great numbers of them in holes in the clay, and sometimes ten or twelve coiled to-

gether. I have observed that either a very wet or very dry situation is fatal to the *Triton* during its state of hibernation, and that a moderately damp one is always chosen for that state of existence; and further, that the *Triton* can live in a solid mass of ice without injury.

“About the last week in March the perfect *Triton* leaves the land and becomes aquatic. It has then acquired all those appearances which exist only during the breeding-season. They are absorbed rather rapidly, and the animal leaves the water in August.

“The *Tritons* of the third and fourth year are found during the cold season in the earth under stones, in clusters of the magnitude of a cricket-ball; those of an earlier period are often found singly at a greater depth under the earth, as before stated.”—p. 381.

### 11. HEMITRITON.

Body tubercular. Males with a slightly-produced vent. Lateral line none.

#### 1. HEMITRITON ALPESTRIS.

B.M.

*Hemitriton alpestris*, Dugès, *l. c. t.* 1. f. 23, 24; Fauna Ital. t. 8. f. 2.

### Fam. III. SALAMANDRIDÆ.

The skull narrow, without any dilatation of the frontal or temporal bone to form a fronto-temporal arch. Palate with a longitudinal series of teeth, arched in front. Tongue moderate, attached, hinder and side edges scarcely free. Body granular. Vertebræ rounded. Ribs and bones of limbs and feet imperfectly ossified. Paratoids large, glandular.

\* *Lateral lines of pores high up the back, elevated, wart-like.*

#### 1. SALAMANDRA.

Palatine teeth extending before the internal nostrils. Tail roundish. Back not crested.

##### 1. SALAMANDRA ATRA.

B.M.

Skull; Dugès, *l. c. t.* 1. f. 8, 9.

##### 2. SALAMANDRA MACULOSA.

B.M.

Skull, Dugès, *l. c. t.* 1. f. 6, 7.

##### 3. SALAMANDRA CORSICA.

Mouth, Bonap. Fauna Ital. ii. t. 53 (cop. Dugès, *l. c. t.* 1. f. 4, 5).



\*\* *Lateral line of pores on lower part of side between axilla and groin.*

## 2. TRITON.

Granular. Tail compressed. Back of male crested. Toes free, simple.

### 1. TRITON CRISTATUS.

B.M.

*Hemisalamandra cristata*, skull, Dugès, *J. c. t.* 1. f. 12, 13 (Erp. Gén. ix. t. 102. f. 2, 3, not sufficiently broad for our specimens).

*Triton marmoratus*, Bibron, Proc. Zool. Soc. 1838, 23 (not Latr.).

*Triton cristatus* & *T. Bibronii*, Bell, Brit. Rept. pp. 129, 131, figs.

Pupil small, circular. Tail with a broad pale-bluish longitudinal streak rather below the centre.

M. Bibron, when in London, on observing a specimen of the Warty Newt with straight lips, in the Collection of the Zoological Society, named it *Triton marmoratus*, probably thinking that it was *Triton marmoratus* of Latreille, a species of the South of Europe.

Mr. Bell, in his work on British Reptiles, figures the specimen, and gives it the name of *Triton Bibronii* (pp. 129 & 131, figs.), observing, "it is the same as *Tr. cristatus*, excepting that the upper lip is perfectly straight."

After examining various specimens in different states, I am convinced that the form of the lip depends on the season, the male in the breeding-season having the most overlapping lip.

The same change in the form of the lip in the different seasons is to be observed in *Lissotriton punctatus*.

Mr. J. Higginbottom observes: "The two species of *Triton* (found in the Midland Counties) present such varied appearances during the three years of their slow but progressive growth, and during the changes they experience preparatory to their return from being inhabitants of the land, breathing atmospheric air, active in the summer and hibernant in the winter, to being denizens of the water, reproducing their kind in the months of March, April, May, June and July, that I think they have been regarded by naturalists as presenting too great a number of distinct species."—*Ann. & Mag. N. H.* 1853, xii. 370.

The skulls and skeletons of all the genera of *Molgidae*, *Plethodontidae*, *Protonopsidae* and *Amphiumidae* I have been able to examine, or which are figured in any works that have occurred to me, resemble those of the family *Salamandridae*.

Considering the very important characters which the examination of the skulls has shown them to possess for the distinction of the European and Japanese species, it is very desirable that the American species should be carefully examined for the same purpose. Up to this time even the description of the palatine teeth of the American species is involved in great uncertainty, the descriptions of Harlan, Holbrook and Baird being often at issue on this important point. It is but just to observe, that when I have had the opportunity of



comparison, I have generally found the descriptions of Dr. Baird the most accurate and trustworthy.

To facilitate this object, I have added a list of the species the skulls of which have been figured.

Fam. MOLGIDÆ.

MOLGE STRIATA, Gray, Cat. Batr. p. 31. t. 3. f. 111; Schlegel, Fauna Japon. t. 5. f. 9, 10.

Fam. PLETHODONTIDÆ.

ONYCHODACTYLUS JAPONICUS, Gray, Cat. Batr. p. 33. t. 3. f. 1; Fauna Japon. t. 3. f. 6.

AMBYOSTOMA OPACUM, Dum. et Bibr. Erp. Gén. ix. t. 10. f. 6.

PLETHODON GLUTINOSUM, Tschudi, Batr. t. 2. f. 4.

DESMOGNATHUS FUSCUS.

*Plethodon fuscum*, Dum. et Bibr. Erp. Gén. t. 101. f. 3. B.M.

SPELERPES RUBRA (skull, fig. 3, p. 293).

"*Bolitoglossa rubra*, Cab. B.M." from Paris.

GEOTRITON FUSCUS, sp., Dum. et Bibr. E. G. ix. 112. t. 102. f. 1.

ŒDIPUS VARIEGATUS.

*Bolitoglossa mexicana*, Dum. et Bibr. Erp. Gén. ix. p. 3. t. 101. f. 4.

ENSATINA ESCHSCHOLTZII, Esch. Zool. Atlas, t. 22.

March 23, 1858.—Dr. Gray, F.R.S., V.P., in the Chair.

DESCRIPTION OF A NEW GENUS OF BOIDÆ FROM OLD CALABAR. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

Mr. Logan has kindly sent to me for examination a number of Snakes and other reptiles which had been collected by the missionaries in Old Calabar.

Among several very interesting species I observed a new genus of the family *Boidæ*, which I have great pleasure in laying before the Society, more especially as it appears to be the indication of a new tribe in that curious family.

This animal belongs to the second section of the family, which is thus characterized :—

- ii. *Tail very short, not, or only very slightly, prehensile. Head indistinct, short.*

It is entirely distinct from the tribes *Cylindrophina*, *Carinina*, and *Tortricina*, and therefore I propose to form for it a tribe (*Calabarina*) by itself, having the same characters as the genus.

## CALABARIA.

Head small, short, rounded in front, the same size as the body. Muzzle depressed, rounded; labial shields flat,  $\frac{8-8}{9-9}$ ; the hinder small, front moderate; rostral shield high, large, triangular; frontal shields three pairs, band-like, subsimilar, followed by a band-like shield continued from side to side, which has behind it a small sub-trigonal shield on each side, with a central large triangular shield between them on the crown. Eyes surrounded by scales on the upper edges of the upper labial shields and the outer edges of the fourth and fifth frontal plates, and with one ocular shield in front and two smaller behind the eyes; loreal shield single, small. Pupil circular. Nostril lateral, between two small nasal shields. Body cylindrical. Scales broad, triangular, polished, rather sunken and subrugose in the centre. Ventral shields very numerous, band-like, transverse, about half as wide as the diameter of the body. Vent small, with a single preanal shield. Spurs large, distinct. Tail short, as thick as the body, blunt and rounded at the end. Subcaudal shields broad, band-like, one-rowed like the ventral shields.

I think it is probable, when some other specimens have been examined, that the band-like shield extending across from the upper edge of each eye will be found to be composed of three shields, like the band behind it, which are here united into one band; and then the head-shields will lie thus:—three pairs of band-like frontal, two smaller triangular superciliary shields over each eye, having in the middle between them two triangular parietal shields.

## CALABARIA FUSCA.

Dark brown, some of the scales yellowish, scattered singly or in groups on the back and sides; ventral shields greyish; sides of the belly with a few unequal yellow spots.

Length 36 inches, diameter 1 inch.

*Hab.* Old Calabar, W. Africa (*W. Logan, Esq.*).

Since this paper was read, I have discovered a young specimen of this *Boa* among the specimens obtained from the Zoological Society, which they had received from Fernando Po. It is about half the length and diameter of the specimen from Old Calabar. It has the head-shields more uniform, and as I supposed they might be when I described that specimen.

It has three pairs of band-like frontal shields over the forehead, a rather large parietal shield behind them on the crown of the head, and two small subequal superciliary shields between the outer edge of the parietal and the eye, on each side a narrow transverse band-like central shield behind, and rather broader than, the parietal shield, with a small scale-like shield, like those on the neck, behind and on the sides of it.

## ON NEMOPHIS, A NEW GENUS OF RIBAND-SHAPED FISHES.

BY DR. J. KAUP.

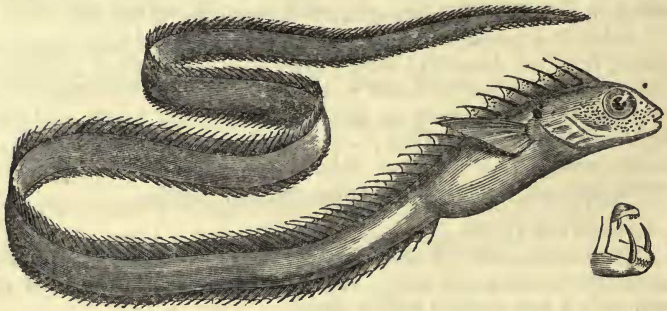
In the collection at the Museum of Natural History in Paris I  
*Ann. & Mag. N. Hist.* Ser. 3. Vol. ii. 21

found, some years ago, when I was describing the order of Eels, this interesting genus, in which the form and function of the canine teeth are extremely remarkable.

Two specimens of this rare fish were received at the Museum, from MM. Lesson and Garnot, without any note: as they were obtained in the expedition of M. Duperrey, I presume they were captured in the South Sea.

One of the specimens being in a half-spoiled condition, I was enabled, but in this specimen only, to observe the paradoxical arrangement and formation of the canine teeth.

From the smallness of the mouth, no one would have expected to find at the end of the small incisors such large slightly-curved canine teeth in the lower jaw. These canine teeth pass through a canal in the flesh round the eye, and have an opening near the eye. These teeth, which cannot be used as true canine teeth on account of the smallness of the mouth, have certainly only the function of fixing and giving the lower jaw a certain direction.



I call this paradoxical form .

#### NEMOPHIS.

Without ventral fins. Mouth small; upper and lower jaw with minute incisors. Small canine teeth in the upper jaw, longer and curved ones in the lower jaw, which are placed, when the mouth is closed, in a canal going round the eyes and opened on the surface near the eyes. Eyes large. Cavity of the gills with a small round opening placed very high. The dorsal fin commences near the eyes, and is connected with the caudal and anal as in the Eels. Pectoral fin developed. Anus at the end of the first eighth of the total length.

#### NEMOPHIS LESSONI, Kp.

It has a length of 255 mm. or 9 Par. inches. Colour silver-white, with black points on the head and end of the tail. Dorsal and anal fins blackish.

Diameter of the eye 5, length of the head to the gill-opening 15, from the muzzle to the anus 32 millimetres.



This genus forms a distinct group among the Riband-shaped Fishes, and is perhaps the type of a different family, which we may call *Nemophidæ*.

April 13, 1858.—Dr. Gray, F.R.S., V.P., in the Chair.

ON THE SNIPE'S "NEIGHING" OR HUMMING NOISE, AND ON ITS TAIL-FEATHERS' SYSTEMATIC VALUE. BY W. MEVES, OF STOCKHOLM. TRANSLATED AND COMMUNICATED BY JOHN WOLLEY, JUN., ESQ., F.Z.S.

On the origin of the neighing sound which accompanies the Common Snipe's (*Scolopax gallinago*, L.) play—flight during pairing time—opinions are various. Bechstein thought that it was produced by means of the beak; Naumann and others, again, that it originated in powerful strokes of the wing: but since Pralle\* in Hanover observed that the bird makes heard its well-known song or cry, which he expresses with the words "gick jack, gick jack!", at the same time with the neighing sound, it seemed to be settled that the latter is not produced through the throat. In the meantime I have remarked with surprise, that the humming sound could never be observed whilst the bird was flying upwards, at which time the tail is closed; but only when it was casting itself downwards in a slanting direction, with the tail strongly spread out.

The peculiar form of the tail-feathers in some foreign species nearly allied to our Snipe (for example, *S. javensis*) encouraged the notion, that the tail, if not alone, at all events in a considerable degree, conduced to the production of the sound. On a closer examination of the tail-feathers of our common species, I found the first (outer) feather, especially, very peculiarly constructed; the shaft, uncommonly stiff, sabre-shaped; the rays of the web strongly bound together and very long, the longest reaching nearly three-fourths of the whole length of the web, these rays lying along (or spanning from end to end of the curve of) the shaft, like the strings of a musical instrument (fig. 1). On blowing from the outer side upon the broad web it comes into vibration, and a sound is heard, which, though fainter, very closely resembles the well-known neighing.

But to prove clearly that it is the first feather which produces the peculiar sound, it is only necessary carefully to pluck out such a one, to fasten its shaft with fine thread to a piece of steel wire a tenth of an inch in diameter and a foot long, and then to fix this at the end of a 4-foot stick. If now the feather be drawn, with its outer side forward, sharply through the air, at the same time making some short movements or shakings of the arm so as to represent the shivering motion of the wings during flight, the neighing sound is produced with the most astonishing exactness.

If we wish to hear the humming of both feathers at once, as must be the case from the flying bird, this also can be managed by a simple contrivance. Taking a small stick, and fastening at the

\* Naumannia.



side of the smaller end a piece of annealed steel wire in the form of a fork, a side tail-feather is bound to each point, and the wire is bent so that the feathers receive the same direction which they do in the spreading of the tail as the bird sinks itself in flight; with this apparatus the feathers are drawn through the air, as before.

Such a sound, but in another tone, is produced when we experiment with the tail-feathers of other kinds of Snipe. But in *S. major*, *capensis*, and *frenata* four humming-feathers (*surr pennor*) are found on each side, which are considerably shorter than in the species we have been speaking of. *Scolopax javensis* has eight on each side, which are extremely narrow and very stiff.

Since in both sexes these feathers have the same form, it is clear that both can produce the humming noise; and by means of experiment I have convinced myself that it is so. But as the feathers of the hen are generally less than those of the cock bird, the noise also made by them is not so deep as in the other case. Professor Nilsson announces, that in the female of the Single Snipe a neighing noise has been already observed.

It would be interesting if travelling ornithologists would in future make observations on the foreign species in a state of nature. It ought to be found that these also have a neighing or humming noise, but differing considerably from that of our species.

Besides the significance which these tail-feathers have as a kind of musical instrument, their form may give a very weighty character in the determination of species standing very near one another, which have been looked upon as varieties.

To call attention to this subject, I have caused to be drawn the tail-feathers of several species. They are the following :—

Fig. 1. *Scolopax (Telmatias, Boie) gallinago*, L.

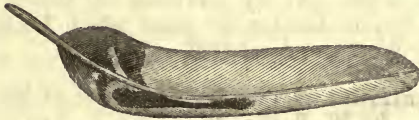


Fig. 2. *Scolopax (Telmatias) capensis*.



Fig. 3. *Scolopax (Telmatias) frenata*, Illig.



Fig. 4. *Scolopax (Telmatias) javensis*.Fig. 5. *Scolopax (Telmatias) major*, L.Fig. 6. *Scolopax (Philolimnos, Brehm) gallinula*, L.

The structure of the tail-feathers in the last-named species differs considerably from that of the others; it gives upon experiment no humming sound; and all the feathers of the tail are, as in *Scolopax rusticola*, formed pretty much like one another.

If it be considered desirable to divide the Linnæan genus *Scolopax* into subgenera, I should propose to class those together which have musical feathers in the tail, under the name *Odura*.

The interesting discovery recorded in the above paper was first announced by M. Meves in an account of the birds observed by himself during a visit to the island of Gottland in the summer of the year 1856, which account appeared in a publication of the Vetenskaps Akademi at Stockholm the following winter.

In the succeeding summer M. Meves kindly showed me his experiments. The mysterious noise of the wilderness was reproduced in a little room in the middle of Stockholm. First the deep bleat now shown to proceed from the male Snipe, and then the fainter bleat of the female, both most strikingly true to nature, neither producible with any other feathers than the outer ones of the tail.

I could not resist asking M. Meves the impertinent question, how, issuing forth from the town for a summer ramble, he came to discover what all the field-naturalists and sportsmen of England and other countries had, for the last century at least, been in vain trying to make out, straining their eyes, and puzzling their wits? He freely explained to me how, in a number of 'Naumannia,' an accidental misprint of the word representing tail-feathers instead of wing-fea-

thers—a mistake which another author took seriously, and ridiculed—first led him to think on the subject. He subsequently examined in the Museum the tail-feathers of various species of Snipe, remarked their structure, and reasoned upon it. Then he blew upon them, and fixed them on levers that he might wave them with greater force through the air; and at the same time he made more careful observations than he had before done of the living birds in the breeding season. In short, in him the obscure hint was thrown upon fruitful ground, whilst in a hundred other minds it had failed to come to life. At my invitation, M. Meves wrote for the Zoological Society of London the paper which I have here translated.—JOHN WOLLEY, April 1858.

#### DESCRIPTION OF TWO NEW SPECIES OF ENTOZOA.

BY W. BAIRD, M.D., F.L.S., ETC.

In 1821 Nitzsch established a new genus of Nematoid Worms in Ersch and Gruber's Encyclopædia. This genus he named *Hedruris*, from the two Greek words ἔδρα, *seat*, and οὐρά, *tail*,—a name by which he intended to indicate the peculiar manner in which the female is attached to the stomach of the animal in which it was found. As yet there has been only one species described, *Hedruris androphora*, which was first discovered in the stomach of the freshwater Newts, *Triton cristatus* and *Lissotriton punctatus*. The female is distinguished by having the caudal extremity swollen and terminated by a suckorial apparatus, by means of which, and with the assistance of a horny claw like the claw of a cat, it adheres firmly to the coat of the stomach of its host. The tail of the male terminates in a sharp curved point, provided with five or six papillæ disposed in a longitudinal series along the under surface. It is always found spirally twisted round the body of the female, and it is no doubt by means of these suckorial papillæ that it keeps itself attached to the female. Dujardin, in his 'Hist. Nat. des Helminthes,' hesitates where to place this genus, and arranges it in an Appendix along with several others, the true position of which he had not satisfactorily ascertained. Diesing, in his 'Systema Helminthum,' places it in the same section with, and immediately following, the genus *Ascaris*, and considers, like Nitzsch, that the species *androphora* is identical with the *Ascaris leptcephala* of Rudolphi. In the Collection of Entozoa in the British Museum are several specimens of a small Nematoid Worm, sent under the name of *Ascaris leptcephala* to the National Collection by M. Siebold. If these are correctly named by this last-mentioned naturalist, the species *Asc. leptcephala* is a true *Ascaris*, and quite distinct from the species from which Nitzsch formed the genus *Hedruris*, a very good figure of which may be seen in the 'Allgemeine Encyclopädie' of Ersch and Gruber, vol. vi. p. 48.

A short time ago I received, through the kind attention of Sir W. Jardine, a specimen of an Entozoon which he took from the abdominal cavity of an Amphibian which has rarely found its way to this country, the *Siredon mexicanus*. Upon examination I ascertained

it to be a female of a new species of this rare genus *Hedruris*. In size it is about four times longer than the *androphora*; it has a larger head, and the body more distinctly striated across. This species I have named *Hedruris Siredonis*; but as only the female has been as yet discovered, I am unable to give a very detailed description of it.

#### HEDRURIS SIREDONIS.

*Female*. Body 13 millimetres long,  $\frac{1}{2}$  millimetre broad, strongly striated across, narrower at the anterior than the posterior extremity, this latter terminating in an obtuse point furnished with what Diesing calls a suctorial papilla, by which it adhered to the coat of the stomach of the *Siredon*. *Male* — ?

*Hab*. Stomach of the *Siredon mexicanus* from Mexico. British Museum Collection.

Along with this interesting species, and in the abdominal cavity of the same animal, were three specimens of another Nematoid Worm of a very different form. I consider it to belong to the family *Strongylidæ*, and to a genus which Dujardin established under the name of *Leptodera*, so called from the long narrow neck (*λεπτός*, narrow, *δέρη*, neck) which distinguishes the species upon which the genus was founded. Only one species of this genus has as yet been described,—the *Leptodera flexilis* of Dujardin, which was found parasitic in the vas deferens of one of the Common Slugs (*Limax cinereus*). This species is only from  $2\frac{1}{2}$  millimetres (male) to 4 mill. (female) in length, whilst the new species from the *Siredon* measures from 16 to 25 mill.

#### LEPTODERA ELONGATA.

*Female*. 25 millimetres long. Body filiform, neck long and slender; tail terminating in a long sharp point. Vulva situated about the middle of the length of the body.

*Male*. 16 millimetres long. Body filiform, neck long and slender, tail sharp-pointed. Spicula double, proceeding from a swelling near the commencement of the tail, and accompanied by two short membranous expansions like wings.

*Hab*. Abdominal cavity of *Siredon mexicanus*. B.M. Collection.

### MISCELLANEOUS.

*On the Flowering of the American Aloe.* By W. SOWERBY.

*To the Editors of the Annals of Natural History.*

GENTLEMEN, Botanic Gardens, Regent's Park, Sept. 20, 1858.

As the American Aloe (*Agave Americana*), although a very common plant, is seldom seen in flower, at least in England, perhaps a few notes on the growth, &c., of the one now in bloom in these Gardens may interest some of the readers of the 'Annals.'